March 19, 2003

Mr. Richard H. Karney, PE
Energy Star Program Manager
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Office of Building Technologies Program
1000 Independence Avenue, SW
Washington, DC 20585

Dear Rich:

Last summer we were asked to supply comments on an Energy Star proposal. That proposal has appeared for the third time as the three-zone proposal. Nothing has changed with regard to that proposal; it is still as flawed today, as it was the first two times. I am sure that you will get the same opposition from part of the industry and the similar support from others that was heard previously. That proposal was tailored to suit the wishes of one glass manufacturer and one window manufacturer who were invited to participate in its drafting. The proposal establishes threshold values, which allow that glass producer's glass package to be in compliance nationwide and allow the window manufacturer to utilize only one glass package for the all 50 states. I don't consider it a good use of time and resources to propose it again. I realize that you're not at fault for previous mistakes, but your luck (good or bad) gives you the opportunity to fix it.

Before I discuss quantitative performance details with regard to Energy Star, I would like to make some qualitative comments. First, I think Energy Star is a great concept for the fenestration industry. Its recognition and growth has been phenomenal. I think it conveys its message to the consumer efficiently (we just need to fine tune the exact message). Second, Passive solar gain in cold climates is a good thing that shouldn't require such a fuss to give it equal respect. In fact, it's absurd that the United States Department of Energy would put forth a program that endorses one product but denies a better performing product for a given region. Third, the National Energy Policy is full of recommendations for removing barriers to markets for technologies that offer energy efficiency. Why can't the US DOE fix its own program without a directive from Congress or the President?

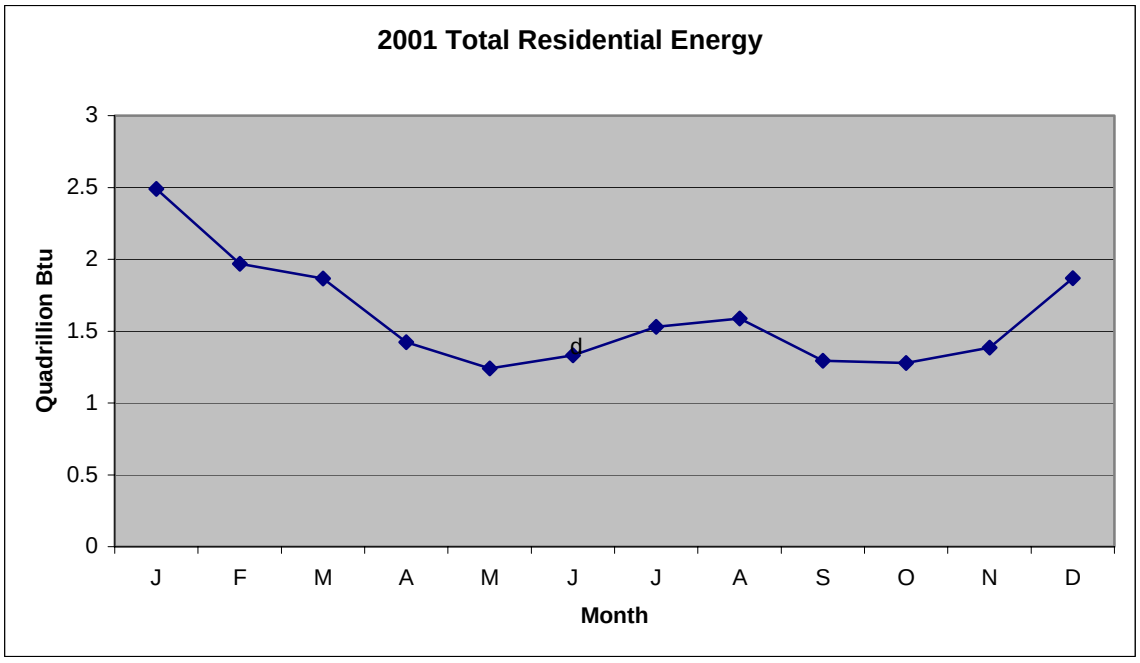
Excluding high solar gain products that offer better performance than the low solar gain products is still not acceptable. Simonton Windows sells both types of glass packages. The cost, price, and profit are the same for both products; we are not financially biased. We want to be able to offer the consumer the best option for his application and optimize the energy savings. Being able to maximize the savings, thus reduce the payback period, is important to us and should be important to the DOE.

At a workshop meeting last spring, the low gain proponents challenged the validity of RESFEN and the importance of peak energy was tossed into the argument. I can't consider such comments an attempt to clarify or help the discussion but only a tactic to create confusion and dilute solid evidence. Since RESFEN doesn't support the low gain argument for the entire nation, it was attacked as being

inaccurate. As a licensed PE, I am very comfortable with the legitimacy of math modeling heat transfer applications. It should be considered hard science.

As for the issue of peak demand, I attempted to find the dates and magnitudes of peak demand for Florida, Texas, California, and New York. Texas, California, and New York have all deregulated, which according to DOE means that data is hard to come by. The Enron/Andersen scandal has cast a serious doubt over any numbers involving energy in Texas and California. New York experiences a wintertime peak load of 24,453 MW's and a summertime peak load of 30,983 MW's (that is for electricity only). NY's Gas and Oil demand has a wintertime peak of about 200% of the summertime peak, which is the expected relationship for a cold climate state like New York. Florida, which is not deregulated and bounded mostly by water (which makes it easier to gather data within its borders), presented some unexpected findings. On July 16, 2002, the summertime peak was 19,064 MW's and on January 5, 2001 the wintertime peak was 18,219 MW's. For a state that is the most cooling dominated, it is astonishing to see that the wintertime peak load is nearly equal to the summer peak load. It would seem that the problem of peak load could actually be helped more by the high gain products if you consider all energy for the entire nation. If you consider electric peak demand only, the impact of the choice between high gain vs. low gain amounts to a less than 5% difference. If you wish to consider electric only, summertime only, and choose a particular state, then the data could perhaps be found to substantially support the notion that low gain products significantly affect summertime peak electrical load for that state. I am not proposing that peak load be considered. The argument was merely presented to justify its exclusion from any decision making for Energy Star. I also support RESFEN as *the* tool for residential energy analysis and annual energy consumption as the criteria for Energy Star compliance.

DOE collects and distributes a vast amount of information and data. Some of the information shared included data that shows the magnitude and timing of the total US energy usage. Tracked for the year 2001, it indicates that more energy is expended in the cold months than the warm months. That is not a surprise, but we shouldn't discriminate against technology that is more effective for those cold months when the seasonal demand increase is significantly larger for the winter.



In June 2002, I submitted data from RESFEN for 39 US cities that are located geographically where the high gain product gives energy savings when compared to the low gain product (north of a line from Phoenix, AZ to Charleston, SC). The average savings of the high gain over the low gain was 7%. I

know that market penetration happens gradually, but even if the Energy Star program only influences a fraction of one percent of the market-- when you are working with a few quadrillion Btu's, won't the result be an important number? Since fenestration purchases last a generation, any delay in changing the Energy Star program will miss an opportunity to decrease energy consumption in the USA for years to come.

Energy Star must implement a program that recognizes the contribution made by a renewable source such as the sun in climates where it is appropriate. I ran RESFEN calculations for a typical house in Atlanta with my exact NFRC numbers for Simonton's ProFinish with low solar gain low-e (U=.34/SHGC=.32). Next I increased the U-factor and then adjusted the SHGC up until equal or better performance was obtained. A .02 increase in SHGC will compensate for a .01 increase in U-factor (not adjusted to source). I chose Atlanta because I was looking for a large city that was geographically close to the magic line where High and low solar gain products provide equal energy savings. The logic is that the resulting data would be conservative and that the substitution would result in even better savings for more northern locals. I would suggest that an alternative be provided for cold climates that would allow:

U=.35, SHGC=any or U=.38/SHGC≥.45 for the Northern Zone.

This simple modification to the four zone option should make the proposal acceptable to all. It does not deny the low gain product access to any market; it does remove the barrier to the high gain product for the northern zone. It allows both products to compete on their merit and should foster future development and enhancements of both technologies. It will allow builders and consumers to select the optimum product and provide the opportunity to make a "cocktail" for a home with the optimum glass package chosen for each elevation.

Simonton Windows proposes the modification and adoption of the four-zone map.

Instead of soliciting approval from technical experts for this option, I browsed the DOE's own archives for previous statements by experts for support on the concepts that one glass package is not suitable for the entire nation and that a high solar gain product is advantageous for cooler and cold climates. Here is a sample of what I found:

1) NREL. National Renewable Energy Laboratory chose a high solar gain product for their own "simple design, cost effective building" that saves 63% of the typical energy consumption.
2) EERE, Energy Efficiency and Renewable Energy publishes *Consumer Energy Information: EREC Fact Sheets.* In the conclusion of a document titled "Advances in Glazing Materials for Windows", it states, "No one type of glazing is suitable for every application. …consumers may discover that they need two types of glazing for a home…"
3) Another EREC Fact Sheet titled "Window Options for Passive Solar" recognizes that the lowest U-value may not be the best choice if it is accompanied by the lowest SHGC. It states, "Typically, the low U-value windows also reject most solar gains (low SHGC). Therefore, it may be difficult to buy a low U-value window with a high SHGC. The right choice is dependent upon the climate."
4) FEMP, Federal Energy Management Program publishes *Low-Energy Building Design Guidelines.* In these guidelines the importance of utilizing or reducing solar gain depending upon the climate is emphasized by the following:

   "Basic energy-saving techniques should be used to reduce building energy use.
   - Reduce cooling loads by eliminating undesirable solar heat gain
   - Reduce heating loads by using desirable solar heat gain"

   The guidelines also state:

   "Residential Buildings-In cold climates, the classic, skin-load dominated building type really benefits from using high-performance, low emissivity (low-e) windows and high levels of insulation. In many cold climates, residential buildings can also significantly benefit from passive solar gain."

5) CHPS Best Practices Manual Guideline, *RE1: Passive Heat and Cooling* suggests that for northern states, south facing windows should have "a high SGHC-usually .6 or higher-to maximize solar heat gain, a low U-factor (.35 or less) to minimize thermal loss," The same guideline also suggest a low SHGC (<.4) and a relaxed U-factor (<.55) for the south.
6) BTS, Office of Building Technology, State and Community Programs publishes a *Technology Fact Sheet*. In a document titled *Passive Solar Design*, BTS states "…design strategies very by location and regional climate, but the techniques remain the same-maximize solar heat gain in winter and minimize it in summer. Specific Techniques include:

    -Select, orient, and size glass to optimize winter heat gain and minimize summer heat gain for the specific climate. Consider selecting different glazing for different sides of the house (exposures)." Regarding windows, BTS says "Heating with solar energy is easy: Just let the sun shine through the windows." For heating climates a specific recommendation is made. "Effective south-facing windows require a high SHGC-usually .6 or higher-to maximize heat gain, a low U-factor (.35 or less) to reduce conductive heat transfer."

It seems that there is wide recognition within DOE that passive solar gain is a good thing for heating dominated climates. It also seems that there is substantial acknowledgement within DOE that one glazing package is not the best solution for the entire nation; in fact, many state that it is not the best solution for all sides of a single house – never mind houses in different climates!

Finally, I consulted a real energy guru, Roxanne. Roxanne isn't an engineer or a scientist; she just knows what works for her. Roxie lives in a heating dominated climate and is just completing her first winter. At the ripe old age of seven months, she voices her opinion about the benefits of passive solar gain by lying at the bottom of the stairs when the sun is coming through (it's the only time she lays in that spot). Hopefully, you've guessed that Roxie is not a human. She is my son's 7-month-old black lab puppy. If she can figure this out, why can't the DOE see past the biased positions of some and simply do the right thing.

Sincerely,

Chuck Anderson, PE
Chuck Anderson, PE
Testing, Code, & Regulatory Affairs Manager
Simonton Windows